WHAT IS CLAIMED IS:

1. A composite nano-particle comprising a core part of a nano-crystal, a surface-modifying part having a bonding part for bonding the periphery of said core part to the nano-crystal and a substance having an insulating shell part having as a substrate a substance forming a glass state, characterized in that the surface of the periphery of said core part is coated with the surface modifying part having the bonding part for bonding to a bond defect of said nano-crystal and the substance having the insulating shell part having as the substrate the substance forming a glass state.

2. A composite nano-particle composed of three parts comprising a core part of a nano-crystal, a surface-modifying part for coating the surface of said core part to modify the surface, and an insulating shell part the peripheral surface of which is charged by the same charge made up of a substance forming a glass state so as to coat the surface of said surface-modifying part.

3. A composite nano-particle composed of three parts of a nano-sized composite nano-particle comprising a core part of a nano-crystal, a surface-modifying part for coating the surface of said core part to modify the surface, and an insulating shell part so formed as to coat the surface of said surface-modifying part, characterized in that said core part and said surface-modifying part are formed simultaneously by a co-precipitation method in the presence of both a dispersion stabilizing agent and a surface-modifying agent.

4. A composite nano-particle described in claim 3, wherein the surface-modifying agent having the surface-modifying part having a covalent bond part forming a covalent bond with a bond defect of said composite nano-particle is an organometallic compound having SH group, $-NH_3$ group at its terminal and that said insulating shell part comprises a transparent material.

5. A composite nano-particle described in any one of claims 1, 2 and 3,

wherein the transparent material made up of the substance forming the glass state constituting said insulating shell part comprises as a main component a compound selected from the group consisting of SiO, SiO_2, SiN, SiON, Si_3N_4, Al_2O_3, and TiO_2.

6. A composite nano-particle described in claim 3, wherein said dispersion-stabilizing agent is sodium citrate and said surface-modifying agent is illustrated by the general formula;

$(R_1O)(R_2O)(R_3O)Si\text{-}R_4\text{-}SH$

wherein each of R_1, R_2, R_3 and R_4 is an alkyl group.

7. A composite nano-particle described in any one of claims 1, 2 and 3, wherein said nano-crystal is a phosphor particle selected from the group consisting of ZnS:Mn, ZnS:Cl, ZnS:Cu, Al, ZnCdS:Ag, Cl, CaS:Eu, CaS:Ce, CaS:Mn, CaS:Cu, CaS:Sb, CaS:Eu, Ce, CaS:Sm, CaS:Pb, CaS:Gd, CaS:Tb, CaS:Dy, CaS:Ho, CaS:Er, CaS;Tm, CaS;Yb, MgS:Eu, MgS:Ce, MgS:Mn, SrS:Eu, SrS:Ce, SrS;Mn, BaS:Eu, BaS:Ce and BaS:Mn.

8. A composite nano-particle described in any one of claims 1, 2 and 3, wherein the surface-modifying layer of the composite nano-particle is carbonized.

9. A method of preparing a composite nano-particle comprising the steps of: forming, at the same time, a core part of a nano-sized phosphor particle and a surface-modifying part for coating the surface of said core to modify the surface of said core by a co-precipitation method in the presence of both a dispersion stabilizing agent and a surface-modifying agent; and forming a nano-sized insulating part on the surface of said surface-modifying part.

10. A method of preparing a composite nano-particle comprising the steps of:forming, at the same time, a core part of a composite nano-particle and a surface-modifying part for coating the surface of said core to modify the surface of said core by a co-precipitation method in the presence of a vitrification-inhibitor for an insulating part comprising as a substrate a

substance for forming a glass state and in the presence of both a dispersion stabilizing agent and a surface-modifying agent; and forming a nano-sized insulating part on the surface of said surface-modifying part.

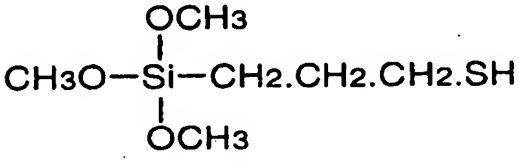
11. A method of preparing a composite nano-particle described in claim 9 or 10, wherein the step of forming the composite nano-particle comprises a step of adding as a material for co-precipitating the phosphor an anion material and a cation material, in that order.

12. A method of preparing a composite nano-particle described in claim 9 or 10, wherein said dispersion-stabilizing agent is a metallic salt having two carboxyl groups or above.

13. A method of preparing a composite nano-particle described in claim 9 or 10, wherein said surface-modifying agent is an organometallic compound having –SH group, $–NH_3$ group at its terminal.

14. A method of preparing a composite nano-particle described in claim 9 or 10, wherein said organometallic compound is 3-mercaptopropyl trimethoxysilane (MPS) illustrated by the chemical formula 1.

(chemical formula 1)



15. A method of preparing a composite nano-particle described in claim 9 or 10, wherein in the step of forming the nano-sized insulating shell layer on the surface of the core layer of the composite nano-particle, said insulating shell layer is formed of sodium silicate.

16. A method of preparing a composite nano-particle described in claim 9 or 10, wherein the composite nano-particle formed by said co-precipitation method is a phosphor particle selected from the group consisting of ZnS:Mn, ZnS:Cl, ZnS:Cu, Al, ZnCdS:Ag, Cl, CaS:Eu, CaS:Ce, CaS:Mn, CaS:Cu, CaS:Sb,

CaS:Eu, Ce, CaS:Sm, CaS:Pb, CaS:Gd, CaS:Tb, CaS:Dy, CaS:Ho, CaS:Er, CaS;Tm, CaS;Yb, MgS:Eu, MgS:Ce, MgS:Mn, SrS:Eu, SrS:Ce, SrS;Mn, BaS:Eu, BaS:Ce and BaS:Mn.